



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,789	04/02/2004	Manabu Shiozaki	50212-587	9928

20277 7590 05/15/2006

MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER

LAVARIAS, ARNEL C

ART UNIT	PAPER NUMBER
----------	--------------

2872

DATE MAILED: 05/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/815,789

Applicant(s)

SHIOZAKI ET AL.

Examiner

Arnel C. Lavarias

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendments to the specification and abstract of the disclosure in the submission dated 3/13/06 are acknowledged and accepted. In view of these amendments, the objections to the specification in Section 6 of the Office Action dated 11/14/05 are respectfully withdrawn.
2. The amendments to Claims 1, 7-9 in the submission dated 3/13/06 are acknowledged and accepted.
3. The addition of Claim 11 in the submission dated 3/13/06 is acknowledged and accepted.

Response to Arguments

4. The Examiner notes that Applicants failed to address the priority issues detailed in Sections 2-3 of the Office Action dated 11/14/05. These are again set forth *infra*.
5. The Examiner additionally notes that Applicants failed to address the issues regarding incorporation by reference in Sections 7-8 of the Office Action dated 11/14/05. These are again set forth *infra*.
6. The Applicants argue that, with respect to newly amended Claim 1, as well as Claims 2-10 which depend on Claim 1, Holm et al. fails to teach or reasonably suggest the first medium having a thickness of 5 microns or more, the second medium having a thickness of 5 microns or more, a first anti-reflection film provided on a surface of the first medium

so as to sandwich the first medium together with the second medium, and a second anti-reflection film provided on a surface of the second medium so as to sandwich the second medium together with the first medium. After reviewing Holm et al., the Examiner agrees, and respectfully withdraws the rejections in Sections 12-15 of the Office Action dated 11/14/05.

7. Claims 1-11 are now rejected as follows.

Priority

8. Acknowledgment is made of applicant's claim for domestic priority under 35 U.S.C. 119(e), however, a specific reference to the prior-filed application in compliance with 37 CFR 1.78(a) is not included in the first sentence(s) of the specification following the title or in an application data sheet.
9. If Applicant desires to claim the benefit of a prior-filed application under 35 U.S.C. 119(e), a specific reference to the prior-filed application in compliance with 37 CFR 1.78(a) must be included in the first sentence(s) of the specification following the title or in an application data sheet. For benefit claims under 35 U.S.C. 120, 121 or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications.

If the instant application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the

Art Unit: 2872

application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was

submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required. Applicant is still required to submit the reference in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

Specification

10. The attempt to incorporate subject matter into this application by reference to the priority provisional application (See Paragraph 0001 of Applicants' disclosure) is ineffective because the priority provisional application is not clearly identified as required by 37 CFR 1.57(b)(2)).
11. The incorporation by reference will not be effective until correction is made to comply with 37 CFR 1.57(b), (c), or (d). If the incorporated material is relied upon to meet any outstanding objection, rejection, or other requirement imposed by the Office, the correction must be made within any time period set by the Office for responding to the objection, rejection, or other requirement for the incorporation to be effective. Compliance will not be held in abeyance with respect to responding to the objection, rejection, or other requirement for the incorporation to be effective. In no case may the correction be made later than the close of prosecution as defined in 37 CFR 1.114(b), or abandonment of the application, whichever occurs earlier.

Art Unit: 2872

Any correction inserting material by amendment that was previously incorporated by reference must be accompanied by a statement that the material being inserted is the material incorporated by reference and the amendment contains no new matter. 37 CFR 1.57(f).

12. The disclosure is objected to because of the following informalities:

Paragraph 0057, line 17- insert 'light' after 'incident'.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1-2, 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holm et al. (U.S. Patent No. 6762880), of record, in view of Friesem et al. (U.S. Patent No. 6215928).

Holm et al. discloses a diffraction grating element (See for example Figures 8-10; col. 12, lines 8-25), comprising: a first medium having a refractive index of n_1 (silicon nitride); a second medium (quartz) arranged so as to be in contact with said first medium, said second medium having a refractive index of n_2 lower than that of said first medium; and a diffraction grating (See 1004 in Figure 10) provided at the interface between said first medium and said second medium, wherein one of said first medium and said second

Art Unit: 2872

medium is a solid, and the other thereof is a solid or a liquid, and wherein, taking the period of said diffraction grating to be Λ , the height of said diffraction grating to be H , the duty ratio of the width of said first medium with respect to the period Λ in said

diffraction grating to be f , and the normalized height expressed by $\left(\frac{n_1}{n_2} - 1\right) \frac{H}{\Lambda}$ to be

H_{norm} , in a two-dimensional plane based on coordinate values (H_{norm} , f), the normalized height H_{norm} and the duty ratio f lie within a region enclosed by linking in sequence, by means of line segments, the point (0.50, 0.32), the point (0.50, 0.75), the point (2.00, 0.90), the point (4.00, 0.90), the point (2.20, 0.76), the point (0.75, 0.32), and the point (0.50, 0.32), or within a region enclosed by linking in sequence, by means of line segments, the point (2.25, 0.20), the point (2.25, 0.44), the point (2.75, 0.44), the point (2.75, 0.20), and the point (2.25, 0.20) (In the instant case, $H_{\text{norm}} = 0.64$, and $f = 0.51$; See col. 12, lines 16-25). Holm et al. additionally discloses the period Λ of the diffraction grating element being $1.46 \mu\text{m}$ or less (See col. 12, lines 16-25); the refractive index ratio $\left(\frac{n_1}{n_2}\right)$ between the first medium and the second medium is 1.25 or more but 1.6 or less

(See col. 12, lines 16-25, wherein the refractive index of quartz is approximately 1.5); the incident angle of the diffraction angle of the light in the second medium of the diffraction grating is 25° or more by 35° or less (See col. 12, lines 16-25); a Bragg condition of the diffraction grating in the diffraction grating element is satisfied (See col. 7, lines 41-65); a third material having a refractive index of n_0 lower than those of the first and second mediums and covering an upper surface of the diffraction grating element (See Figure 4;

col. 7, lines 34-65, in which the third material is air); and a fourth material having a refractive index of n_0 lower than those of the first and second mediums and covering a lower surface of the diffraction grating element opposing the upper surface (See Figure 4; col. 7, lines 34-65, in which the fourth material is air). Holm et al. lacks the first medium having a thickness of 5 microns or more, the second medium having a thickness of 5 microns or more, a first anti-reflection film provided on a surface of the first medium so as to sandwich the first medium together with the second medium, and a second anti-reflection film provided on a surface of the second medium so as to sandwich the second medium together with the first medium. However, Holm et al. additionally teaches that the first and second mediums contacting each other and having the diffraction grating at the interface between these mediums may be adjusted in thickness such that they may have the same thicknesses or different thicknesses (See col. 7, lines 34-40). In addition, these thicknesses may be adjusted based on the intended application, the materials utilized for the mediums, the requisite depths of the grooves of the grating, and mechanical support. It is believed that it would be readily evident to one of ordinary skill in the art to utilize thicker mediums (e.g. several hundred microns to several mm in thickness) to provide better structural integrity and rigidity for these mediums. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first medium have a thickness of 5 microns or more and the second medium have a thickness of 5 microns or more, for the purpose of avoiding or reducing damage to the grating structure, particularly during handling and use. The teachings of Holm et al. above lack a first anti-reflection film provided on a surface of the first

medium so as to sandwich the first medium together with the second medium, and a second anti-reflection film provided on a surface of the second medium so as to sandwich the second medium together with the first medium. However, Friesem et al. teaches a conventional diffraction grating element utilized in an active wavelength device (See for example Figures 3-4), wherein a first anti-reflection film (See for example 138 in Figure 3) may be provided to sandwich the first medium (See for example 132, 134, 136 in Figure 3) together with the second medium (See for example 122, 126, 124, 120 in Figure 3), and a second anti-reflection film (See for example 139 in Figure 3) may be provided to sandwich the second medium (See for example 122, 126, 124, 120 in Figure 3) together with the first medium (See for example 132, 134, 136 in Figure 3). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the element of Holm et al., further include a first anti-reflection film provided on a surface of the first medium so as to sandwich the first medium together with the second medium, and a second anti-reflection film provided on a surface of the second medium so as to sandwich the second medium together with the first medium, as taught by Friesem et al., for the purpose of reducing or eliminating unwanted Fresnel back reflections, which contribute to optical noise in the optical system.

15. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holm et al. in view of Friesem et al.

Holm et al. in view of Friesem et al. discloses the invention as set forth above in Claim 1, except for, in the two-dimensional plane based on coordinate values (H_{norm} , f), the normalized height H_{norm} and the duty ratio f lie within a region enclosed by linking in

sequence, by means of line segments, the point (0.80, 0.62), the point (0.80, 0.65), the point (1.00, 0.75), the point (1.60, 0.82), the point (1.75, 0.82), the point (0.96, 0.60), and the point (0.80, 0.62). However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have, in the two-dimensional plane based on coordinate values (H_{norm} , f), the normalized height H_{norm} and the duty ratio f lie within a region enclosed by linking in sequence, by means of line segments, the point (0.80, 0.62), the point (0.80, 0.65), the point (1.00, 0.75), the point (1.60, 0.82), the point (1.75, 0.82), the point (0.96, 0.60), and the point (0.80, 0.62), since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to have, in the two-dimensional plane based on coordinate values (H_{norm} , f), the normalized height H_{norm} and the duty ratio f lie within a region enclosed by linking in sequence, by means of line segments, the point (0.80, 0.62), the point (0.80, 0.65), the point (1.00, 0.75), the point (1.60, 0.82), the point (1.75, 0.82), the point (0.96, 0.60), and the point (0.80, 0.62), for the purpose of maximizing the diffraction efficiency for particular diffraction order(s) and/or polarization(s) at the particular operational wavelength of light. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235.

16. Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holm et al. in view of Friesem et al. as applied to Claim 1 above, and further in view of Fabiny et al. (U.S. Patent No. 6747799), of record.

Holm et al. in view of Friesem et al. discloses the invention as set forth above in Claim 1, except for an optical module or optical communications system including the

diffraction grating element for multiplexing or demultiplexing signal light. However, Fabiny et al. teaches a conventional diffraction grating (See for example Figures 2, 5) which is structurally similar to the diffraction grating of Holm et al. in view of Friesem et al., wherein the diffraction grating may be utilized in an optical module in an optical communications system for multiplexing and demultiplexing an incident optical signal. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have an optical module or optical communications system include the diffraction grating element of Holm et al. in view of Friesem et al., for multiplexing or demultiplexing signal light, as taught by Fabiny et al., to take advantage of the increased diffraction efficiency provided by the diffraction element, thus reducing optical signal losses during multiplexing and demultiplexing operations.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2872

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias
Patent Examiner
Group Art Unit 2872
5/9/06